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TECHNICAL EVALUATION REPORT

CONTROL OF HEAVY LOADS

INDIANA AND MICHIGAN ELECTRIC COMPANY
DONALD C. COOK NUCLEAR PLANT UNITS 1 AND 2

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1. INTRODUCTION

1.1 PURPOSE OF REVIEW

This technical evaluation report documents the Franklin Research Center's (FRC) review of general load handling policy and procedures at the Indiana and Michigan Electric Company's (IMEC) Donald C. Cook Nuclear Plant Units 1 and 2. This evaluation was performed with the following objectives:

- to assess conformance to the general load handling guidelines of NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants" [1], Section 5.1.1
- to assess conformance to the interim protection measures of NUREG-0612, Section 5.3.

1.2 GENERIC BACKGROUND

Generic Technical Activity Task A-36 was established by the U.S. Nuclear Regulatory Commission (NRC) staff to systematically examine staff licensing criteria and the adequacy of measures in effect at operating nuclear power plants to assure the safe handling of heavy loads and to recommend necessary changes in these measures. This activity was initiated by a letter issued by the NRC staff on May 17, 1978 [2] to all power reactor licensees, requesting information concerning the control of heavy loads near spent fuel.

The results of Task A-36 were reported in NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants." The staff's conclusion from this evaluation was that existing measures to control the handling of heavy loads at operating plants, although providing protection from certain potential problems, do not adequately cover the major causes of load handling accidents and should be upgraded.

In order to upgrade measures for the control of heavy loads, the staff developed a series of guidelines designed to achieve a two-part objective using an accepted approach or protection philosophy. The first portion of the objective, achieved through a set of general guidelines identified in NUREG-0612, Article 5.1.1, is to ensure that all load handling systems at nuclear power plants are designed and operated so that their probability of

failure is uniformly small and appropriate for the critical tasks in which they are employed. The second portion of the staff's objective, achieved through guidelines identified in NUREG-0612, Articles 5.1.2. through 5.1.5, is to ensure that, for load handling systems in areas where their failure might result in significant consequences, either (1) features are provided, in addition to those required for all load-handling systems, to ensure that the potential for a load drop is extremely small (e.g., a single-failure-proof crane) or (2) conservative evaluations of load-handling accidents indicate that the potential consequences of any load drop are acceptably small. Acceptability of accident consequences is quantified in NUREG-0612 into four accident analysis evaluation criteria.

The approach used to develop the staff guidelines for minimizing the potential for a load drop was based on defense in depth and is summarized as follows:

1. provide sufficient operator training, handling system design, load handling instructions, and equipment inspection to assure reliable operation of the handling system

2. define safe load travel paths through procedures and operator training so that, to the extent practical, heavy loads are not carried over or near irradiated fuel or safe shutdown equipment

3. provide mechanical stops or electrical interlocks to prevent movement of heavy loads over irradiated fuel or in proximity to equipment associated with redundant shutdown paths.

Staff guidelines resulting from the foregoing are tabulated in Section 5 of NUREG-0612. Section 6 of NUREG-0612 recommended that a program be initiated to ensure that these guidelines are implemented at operating plants.

1.3 PLANT-SPECIFIC BACKGROUND

On December 22, 1980, the NRC issued a letter [3] to IMEC, the Licensee for D.C. Cook Units 1 and 2, requesting that the Licensee review provisions for handling and control of heavy loads at D.C. Cook Units 1 and 2, evaluate these provisions with respect to the guidelines of NUREG-0612, and provide certain additional information to be used for an independent determination of conformance to these guidelines. IMEC responded on July 31, 1981 [4].

2. EVALUATION AND RECOMMENDATIONS

FRC's evaluation of load handling at D.C. Cook Units 1 and 2 is divided into two categories. These categories deal separately with the general guidelines of Article 5.1.1 and the recommended interim protection measures of Article 5.3 of NUREG-0612. Applicable guidelines are referenced in each category. FRC's conclusion and recommendations are provided in the summary for each guideline.

2.1 GENERAL GUIDELINES

The NRC has established seven general guidelines which must be met in order to provide the defense-in-depth approach for the handling of heavy loads. These guidelines consist of the following criteria from Section 5.1.1 of NUREG-0612:

- Guideline 1 - Safe Load Paths
- Guideline 2 - Load Handling Procedures
- Guideline 3 - Crane Operator Training
- Guideline 4 - Special Lifting Devices
- Guideline 5 - Lifting Devices (Not Specially Designed)
- Guideline 6 - Cranes (Inspection, Testing, and Maintenance)
- Guideline 7 - Crane Design.

These seven guidelines should be satisfied for all overhead handling systems and programs used to handle heavy loads in the vicinity of the reactor vessel, near spent fuel in the spent fuel pool, or in other areas where a load drop may damage safe shutdown systems. The Licensee's verification of the extent to which these guidelines have been satisfied and FRC's evaluation of this verification are contained in the succeeding paragraphs.

2.1.1 Overhead Heavy Load Handling Systems

IMEC conducted a review of the overhead handling systems which handle heavy loads in the vicinity of irradiated fuel or safe shutdown equipment and determined that the following cranes were subject to this review:

- o auxiliary building crane
- o new and spent fuel handling crane
- o polar cranes (one per unit)
- o manipulator cranes (one per unit).

2.1.2 Safe Load Paths [Guideline 1, NUREG-0612, Article 5.1.1(1)]

"Safe load paths should be defined for the movement of heavy loads to minimize the potential for heavy loads, if dropped, to impact irradiated fuel in the reactor vessel and in the spent fuel pool, or to impact safe shutdown equipment. The path should follow, to the extent practical, structural floor members, beams, etc., such that if the load is dropped, the structure is more likely to withstand the impact. These load paths should be defined in procedures, shown on equipment layout drawings, and clearly marked on the floor in the area where the load is to be handled. Deviations from defined load paths should require written alternative procedures approved by the plant safety review committee."

a. Summary of Licensee Statements and Conclusions

The Licensee stated that defined load paths are being imposed on the movement of heavy loads in the auxiliary building in the vicinity of the new fuel storage area. Heavy loads listed in Table 3.1, with the exception of radiation protection shields, are moved at a height of 7 feet from the floor and as close as possible to the south wall. The auxiliary building crane, unloaded, is moved through the restricted area with the carriage as close as possible to the south wall. The Licensee stated that special procedures for handling heavy loads in the auxiliary building will be written to cover the above restrictions and the load path will be indicated on the floor.

Heavy loads in the containment building are handled by the polar crane. A procedure will be developed to define the load path for the missile shields and cavity bulkhead sections.

b. FRC Evaluation

The Licensee's response provides insufficient information for FRC to determine if safe load paths have been developed for the individual heavy loads handled by the polar cranes. A review of the plant arrangement drawings showing

the safe load paths in the auxiliary building indicates that the load paths are defined by excluding specific areas, rather than by defining individual safe load paths for each heavy load handled in the vicinity of irradiated fuel or safe shutdown equipment. Insufficient information was provided by the Licensee to allow FRC to determine if heavy loads are handled in accordance with the following criteria:

1. load paths have been selected to follow, to the extent practical, structural floor members
2. load paths are clearly marked on the floor
3. load paths are defined in the procedures
4. deviations from established load paths require written alternatives approved by the plant safety review committee
5. load paths are shown on equipment layout drawings.

c. FRC Conclusions and Recommendations

IMEC does not comply with Guideline 1. The Licensee should develop safe load paths for individual heavy loads handled in the vicinity of irradiated fuel or safe shutdown equipment.

The Licensee should ensure that the safe load paths comply with the criteria of this guideline (i.e., load paths are defined in procedures and drawings, follow structural members, are clearly marked, and deviations are strictly controlled).

2.1.3 Load Handling Procedures [Guideline 2, NUREG-0612, Article 5.1.1(2)]

"Procedures should be developed to cover load handling operations for heavy loads that are or could be handled over or in proximity to irradiated fuel or safe shutdown equipment. At a minimum, procedures should cover handling of those loads listed in Table 3-1 of NUREG-0612. These procedures should include: identification of required equipment; inspections and acceptance criteria required before movement of load; the steps and proper sequence to be followed in handling the load; defining the safe path; and other special precautions."

a. Summary of Licensee Statements and Conclusions

Procedures are in effect to govern the movement of heavy loads that are or could be handled near irradiated fuel or safe shutdown equipment. The procedures include identification of required equipment, inspection and acceptance criteria required before movement of the load, and other special procedures. Procedures for the spent fuel shipping cask will be developed when required. Procedures for handling the missile shields and bulkhead walls including the designated load paths will be prepared.

b. FRC Evaluation

IMEC partially satisfies the criteria of Guideline 2; however, the information supplied was not sufficient for FRC to determine (1) if the procedures include the steps and proper sequence to be followed in handling the load and (2) if safe load paths have been defined.

FRC does not find it acceptable for safe load paths and procedures not to have been established for the spent fuel shipping cask. Since this review by FRC constitutes the only comprehensive evaluation of load handling practices at D.C. Cook Units 1 and 2, all issues should be resolved either by compliance with the guideline or, if in the case of non-compliance, by instituting the recommended corrective actions within a reasonable period of time so that no items are deferred to a future unspecified date. Therefore, the Licensee should develop the necessary safe load paths for the spent fuel shipping cask in anticipation of subsequent load handling operations.

c. FRC Conclusions and Recommendations

D.C. Cook Units 1 and 2 partially comply with Guideline 2. In order to fully comply, IMEC should revise heavy load handling procedures to ensure that (1) safe load paths are defined and (2) the steps and proper sequence to be followed in handling the load are included. The Licensee should develop procedures for handling the spent fuel shipping cask, missile shields, and cavity bulkhead sections.

2.1.4 Crane Operator Training [Guideline 3, NUREG-0612, Article 5.1.1(3)]

"Crane operators should be trained, qualified and conduct themselves in accordance with Chapter 2-3 of ANSI B30.2-1976, 'Overhead and Gantry Cranes' [5]."

a. Summary of Licensee Statements and Conclusions

The Licensee stated:

"Crane operators are trained, qualified, and are to conduct themselves in accordance with Section 2-3 of ANSI B30.2-1976, 'Overhead and Gantry Cranes.' No exceptions are taken to ANSI B30.2-1976 with respect to operator training, qualifications, and conduct."

b. FRC Evaluation

The Licensee has implemented crane operator training and qualification programs at D.C. Cook Units 1 and 2. However, the Licensee has not verified that programs exist to monitor operator conduct in accordance with Section 2-3.1.7 of ANSI B30.2, but has stated that crane operators are expected to conduct themselves in accordance with this guideline.

c. FRC Conclusions and Recommendations

D.C. Cook Units 1 and 2 comply with Guideline 3. Training and qualification programs developed by D.C. Cook Units 1 and 2 comply with ANSI B30.2. The Licensee should verify that suitable programs to monitor or ensure proper operator conduct have been implemented. These programs may consist of review of operator conduct during training and qualification, surveillance or monitoring of operators during actual load handling by plant safety or quality assurance personnel, or supervision of load handling by selected senior crane or plant supervisors.

2.1.5 Special Lifting Devices [Guideline 4, NUREG-0612, Article 5.1.1(4)]

"Special lifting devices should satisfy the guidelines of ANSI N14.6-1978, 'Standard for Special Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 kg) or More for Nuclear Materials' [6]. This standard should apply to all special lifting devices which carry heavy loads in

areas as defined above. For operating plants certain inspections and load tests may be accepted in lieu of certain material requirements in the standard. In addition, the stress design factor stated in Section 3.2.1.1 of ANSI N14.6 should be based on the combined maximum static and dynamic loads that could be imparted on the handling device based on characteristics of the crane which will be used. This is in lieu of the guideline in Section 3.2.1.1 of ANSI N14.6 which bases the stress design factor on only the weight (static load) of the load and of the intervening components of the special handling device."

a. Summary of Licensee Statements and Conclusions

The Licensee stated that the requirements for special lifting devices, as set forth in ANSI N14.6-1978, "Standards for Special Lifting Devices for Shipping Containers Weighing 10,000 Pounds or More for Nuclear Materials," are met in the following procedures:

- load monitoring device verification instructions
- manipulator crane load test
- auxiliary building crane interlock verification fuel handling
- shipment of reactor vessel material surveillance capsule using SWRI cask and equipment.

b. FRC Evaluation

The Licensee has developed a set of procedures which meet the criteria of Section 5 (Acceptance Testing and Assurance of Continued Compliance) of ANSI N14.6-1978. However, the Licensee did not discuss the criteria of Section 3 (Design), Section 4 (Fabrication), or Section 6 (Special Lifting Devices for Critical Loads) of ANSI N14.6 or the requirements of this guideline.

c. FRC Conclusions and Recommendations

D.C. Cook Units 1 and 2 partially comply with Guideline 4. The Licensee should evaluate those special lifting devices in use to determine compliance with Sections 3, 4, and 6 of ANSI N14.6-1978 prior to their next use.

2.1.6 Lifting Devices (Not Specially Designed) [Guideline 5, NUREG-0612, Article 5.1.1(5)]

"Lifting devices that are not specially designed should be installed and used in accordance with the guidelines of ANSI B30.9-1971, 'Slings' [7]. However, in selecting the proper sling, the load used should be the sum of the static and maximum dynamic load. The rating identified on the sling should be in terms of the 'static load' which produces the maximum static and dynamic load. Where this restricts slings to use on only certain cranes, the slings should be clearly marked as to the cranes with which they may be used."

a. Summary of Licensee Statements and Conclusions

The Licensee stated:

"Lifting devices that are not specially designed follow the guidelines set forth in Handbook for Riggers by W.G. Newberry, revised edition 1977."

b. FRC Evaluation

IMEC did not provide sufficient information for FRC to determine if the lifting devices not specially designed are installed and used in accordance with ANSI B30.9-1971, or if plant procedures ensure proper sling selection, rating, and identification.

c. FRC Conclusions and Recommendations

A conclusion with respect to Guideline 5 must be deferred. IMEC should review all handling devices, identify those which are not specially designed and are used in the vicinity of irradiated fuel or safe shutdown equipment, and ensure that these devices conform to the criteria of ANSI B30.9-1971 before they are next used. IMEC should also ensure the following:

1. sling selection is based upon the sum of static and maximum dynamic loads

2. slings are marked with the "static load" which produces the maximum static and dynamic loads

3. slings restricted to use with only certain cranes are clearly marked to so indicate.

2.1.7 Cranes (Inspection, Testing, and Maintenance) [Guideline 6, NUREG-0612, Article 5.1.1(6)]

"The crane should be inspected, tested, and maintained in accordance with Chapter 2-2 of ANSI B30.2-1976, 'Overhead and Gantry Cranes,' with the exception that tests and inspections should be performed prior to use where it is not practical to meet the frequencies of ANSI B30.2 for periodic inspection and test, or where frequency of crane use is less than the specified inspection and test frequency (e.g., the polar crane inside a PWR containment may only be used every 12 to 18 months during refueling operations, and is generally not accessible during power operation. ANSI B30.2, however, calls for certain inspections to be performed daily or monthly. For such cranes having limited usage, the inspections, test, and maintenance should be performed prior to their use)."

a. Summary of Licensee Statements and Conclusions

The cranes at D.C. Cook Units 1 and 2 are inspected, tested, and maintained in accordance with Chapter 2-2 of ANSI B30.2-1976.

b. FRC Evaluation

The Licensee has committed to crane inspection, testing, and maintenance in accordance with ANSI B30.2-1976.

c. FRC Conclusion

IMEC complies with the criteria of Guideline 6.

2.1.8 Crane Design [Guideline 7, NUREG-0612, Article 5.1.1(7)]

"The crane should be designed to meet the applicable criteria and guidelines of Chapter 2-1 of ANSI B30.2-1976, 'Overhead and Gantry Cranes,' and of CMAA-70, 'Specifications for Electric Overhead Traveling Cranes' [8]. An alternative to a specification in ANSI B30.2 or CMAA-70 may be accepted in lieu of specific compliance if the intent of the specification is satisfied."

a. Summary of Licensee Statements and Conclusions

The Licensee stated that the cranes at the D.C. Cook Units were built by Whiting Corporation in accordance with Electric Overhead Crane Institute

Specification 61 (EOCI-61) [9] and ANSI B30.2-1967. The Licensee is investigating the differences between the older specifications (EOCI-61 and ANSI B30.2-1967) and current specifications.

b. FRC Evaluation

The Licensee has not provided sufficient information for FRC to evaluate the design of the cranes in use at D.C. Cook Units 1 and 2.

c. FRC Conclusions and Recommendations

A conclusion with respect to Guideline 7 must be deferred. The Licensee should perform a point-by-point comparison between design standards invoked in the specification of their cranes and those required by staff Guideline 7, identify variations between the two, and justify the acceptability of current crane operations where the later standards are more stringent.

2.2 INTERIM PROTECTION MEASURES

The NRC has established six interim protection measures to be implemented at operating nuclear power plants to provide reasonable assurance that no heavy loads will be handled over the spent fuel pool and that measures exist to reduce the potential for accidental load drops to impact on fuel in the core or spent fuel pool. Four of the six interim measures of the report consist of general Guideline 1, Safe Load Paths; Guideline 2, Load Handling Procedures; Guideline 3, Crane Operator Training; and Guideline 6, Cranes (Inspection, Testing, and Maintenance). The two remaining interim measures cover the following criteria:

1. Heavy load technical specifications
2. Special review for heavy loads handled over the core.

Licensee implementation and evaluation of these interim protection measures is contained in the succeeding paragraphs of this section.

2.2.1 Technical Specifications [Interim Protection Measure 1, NUREG-0612, Article 5.3(1)]

"Licenses for all operating reactors not having a single-failure-proof overhead crane in the fuel storage pool area should be revised to include a specification comparable to Standard Technical Specification 3.9.7, 'Crane Travel - Spent Fuel Storage Pool Building,' for PWR's and Standard Technical Specification 3.9.6.2, 'Crane Travel,' for BWR's, to prohibit handling of heavy loads over fuel in the storage pool until implementation of measures which satisfy the guidelines of Section 5.1."

a. Summary of Licensee Statements and Conclusions

The Licensee made no statements or conclusions regarding this interim protection measure.

b. FRC Evaluation

Technical specifications implemented by the Licensee (Technical Specification 3.9.7) state that "Loads in excess of 2500 pounds shall be prohibited from travel over fuel assemblies in the fuel storage pool." This technical specification satisfies the criteria of Interim Protection Measure 1.

c. FRC Conclusions and Recommendations

D.C. Cook Units 1 and 2 comply with Interim Protection Measure 1.

2.2.2 Administrative Controls [Interim Protection Measures 2, 3, 4, and 5, NUREG-0612 Articles 5.3(2) - 5.3(5)]

"Procedural or administrative measures [including safe load paths, load handling procedures, crane operator training, and crane inspection]... can be accomplished in a short time period and need not be delayed for completion of evaluations and modifications to satisfy the guidelines of Section 5.1 of [NUREG-0612]."

a. Summary of Licensee Statements and Conclusions

Summaries of Licensee statements and conclusions are contained in discussions of the respective general guidelines in Sections 2.1.2, 2.1.3, 2.1.4, and 2.1.7.

b. FRC Evaluations, Conclusions, and Recommendations

FRC's evaluations, conclusions, and recommendations are contained in discussions of the respective general guidelines in Sections 2.1.2, 2.1.3, 2.1.4, and 2.1.7.

2.2.3 Special Reviews for Heavy Loads Over the Core [Interim Protection Measure 6, NUREG-0612, Article 5.3(6)]

"Special attention should be given to procedures, equipment, and personnel for the handling of heavy loads over the core, such as vessel internals or vessel inspection tools. This special review should include the following for these loads: (1) review of procedures for installation of rigging or lifting devices and movement of the load to assure that sufficient detail is provided and that instructions are clear and concise; (2) visual inspections of load bearing components of cranes, slings, and special lifting devices to identify flaws or deficiencies that could lead to failure of the component; (3) appropriate repair and replacement of defective components; and (4) verify that the crane operators have been properly trained and are familiar with specific procedures used in handling these loads, e.g., hand signals, conduct of operations, and content of procedures."

a. Summary of Licensee Statements and Conclusions

The Licensee made no statements or conclusions regarding this interim protection measure.

b. FRC Evaluation

The Licensee has provided insufficient information for FRC to determine compliance with Interim Protection Measure 6.

c. FRC Conclusions and Recommendations

A conclusion with respect to this interim protection measure must be deferred. The Licensee should perform a special review of heavy loads handled over the core.

3. CONCLUDING SUMMARY

This summary is provided to consolidate the conclusions and recommendations of Section 2 and to document FRC's overall evaluation of the handling of heavy loads at D.C. Cook Units 1 and 2. It is divided into two sections dealing with general provisions for load handling at nuclear power plants (NUREG-0612, Article 5.1.1) and the staff recommendations for interim protection, pending complete implementation of the guidelines of NUREG-0612 (NUREG-0612, Article 5.3). In each case, recommendations for additional Licensee action, and additional NRC staff action where appropriate, are provided.

3.1 GENERAL PROVISIONS FOR LOAD HANDLING

The NRC staff has established seven guidelines concerning provisions for handling heavy loads in the area of the reactor vessel, near stored spent fuel, or in other areas where an accidental load drop could damage safe shutdown systems. Compliance with these guidelines is necessary to ensure that load handling system design, administrative controls, and operator training and qualification are such that the possibility of a load drop is very small for the critical functions performed by cranes at nuclear power plants. These guidelines are partially satisfied at D.C. Cook Units 1 and 2. This conclusion is presented in tabular form as Table 3.1. Specific recommendations for achieving full compliance with these guidelines are provided as follows:

Guideline		Recommendation
1	a.	Develop safe load paths for heavy loads handled in the vicinity of irradiated fuel or safe shutdown equipment.
	b.	Ensure that safe load paths are defined in procedures and drawings, follow structural members, and are clearly marked, and that deviations are properly controlled.
2	a.	Revise handling procedures to ensure that safe load paths are defined and that the steps and proper sequence to be followed in handling the load are included.

Table 3.1. D.C. Cook Units 1 and 2/NUREG-0612 Compliance Matrix

Heavy Loads	Height or Capacity (tons)	Guideline 1 Safe Load Paths	Guideline 2 Procedures	Guideline 3 Crane Operator Training	Guideline 4 Special Lifting Devices	Guideline 5 Slings	Guideline 6 Crane - Test and Inspection	Guideline 7 Crane Design	Interim Measure 1 Technical Specification	Interim Measure 6 Special Attention
1. Polar Crane	Main 250	---	---	C	---	---	C	I	---	---
	Aux 35	---	---	C	---	---	C	I	---	---
Reactor Vessel Head	102	NC	PC	---	PC	---	---	---	---	I
Upper Internals	58	NC	PC	---	PC	---	---	---	---	I
Lower Internals	80	NC	PC	---	PC	---	---	---	---	I
In-Service Inspection Tool	1.5	NC	PC	---	PC	---	---	---	---	I
Missile Shields	100	NC	NC	---	---	I	---	---	---	I
Cavity Bulkhead Sections	40	NC	NC	---	---	I	---	---	---	I
Plant Equipment (Max)	38	NC	PC	---	---	I	---	---	---	I
2. Manipulator Crane	1.5	---	---	C	---	---	C	I	---	---
New and Spent Fuel	0.95	NC	PC	---	PC	---	---	---	---	I

C = Licensee action complies with NUREG-0612 Guideline.
NC = Licensee action does not comply with NUREG-0612 Guideline.
PC = Licensee action partially complies with NUREG-0612 Guideline.
I = Insufficient information provided by the Licensee.
--- = Not applicable.

Table 3.1 (Cont.)

Heavy Loads	Weight or Capacity (tons)	Guideline 1 Safe Load Paths	Guideline 2 Procedures	Guideline 3 Crane Operator Training	Guideline 4 Special Lifting Devices	Guideline 5 Slings	Guideline 6 Crane - Test and Inspection	Guideline 7 Crane Design	Interim Measure 1 Technical Specification	Interim Measure 6 Special Attention
3. Auxiliary Building Crane	Main 150	---	---	C	---	---	C	I	---	---
	Aux 20	---	---	C	---	---	C	I	---	---
Spent Fuel Shipping Cask	110	NC	PC	---	PC	---	---	---	C	---
Radiation Protection Shields	55	NC	PC	---	---	I	---	---	C	---
Irradiated Specimen Shipping Cask	2	NC	PC	---	---	I	---	---	C	---
Plant Equipment (Max)	4	NC	PC	---	---	I	---	---	C	---
New Fuel Shipping Containers with Assembly	1.5	NC	PC	---	PC	---	---	---	C	---
Spent Fuel Assembly	0.95	NC	PC	---	PC	---	---	---	C	---
New Fuel Assembly	0.95	NC	PC	---	PC	---	---	---	C	---
Superstructure New and Spent Fuel Crane	25	NC	PC	---	---	I	---	---	C	---
Equipment Hatch	45	NC	PC	---	---	I	---	---	C	---
Reactor Coolant Pump Rotating Assembly	28	NC	PC	---	---	I	---	---	C	---
Reactor Coolant Pump Motor	38	NC	PC	---	---	I	---	---	C	---

b. Develop procedures for the spent fuel shipping cask, missile shields, and bulkhead walls.

3 (D.C. Cook Units 1 and 2 comply with this guideline.)

4 Evaluate special lifting devices in use for compliance with ANSI N14.6-1978 prior to their next use.

5 Identify those lifting devices not specially designed used in the vicinity of irradiated fuel or safe shutdown equipment and ensure that these devices conform to the requirements of ANSI B30.9-1971 and this guideline prior to their next use.

6 (D.C. Cook Units 1 and 2 comply with this guideline.)

7 Conduct a point-by-point comparison between design standards of the plant's cranes and those required by this guideline.

3.2 INTERIM PROTECTION MEASURES

The NRC staff has established (NUREG-0612, Article 5.3) that certain measures should be initiated to provide reasonable assurance that handling of heavy loads will be performed in a safe manner until final implementation of the general guidelines of NUREG-0612, Article 5.1 is complete. Specified measures include the implementation of a technical specification to prohibit the handling of heavy loads over fuel in the storage pool; compliance with Guidelines 1, 2, 3, and 6 of NUREG-0612, Section 5.1.1; a review of load handling procedures and operator training; and a visual inspection program, including component-repair or replacement as necessary of cranes, slings, and special lifting devices to eliminate deficiencies that could lead to component failure. FRC's evaluation of information provided by the Licensee indicates that the following actions are necessary to ensure that the staff's measures for interim protection at D.C. Cook Units 1 and 2 are met:

Interim Measure	Recommendation
1	(D.C. Cook Units 1 and 2 comply with this interim measure.)
2, 3, 4	Implement the recommendations of Guidelines 1, 2, and 3 identified in Section 3.1.

Interim Measure	Recommendation
5	(D.C. Cook Units 1 and 2 comply with this interim measure.)
6	Perform the special review required by this interim measure.

3.3 SUMMARY

Measures have been implemented at Indiana and Michigan Electric Company's Donald C. Cook Units 1 and 2 which satisfy and comply, to some extent, with NRC general guidelines and interim protection measures identified in NUREG-0612. In particular, implementation of ANSI B30.2-1976 for crane operator training and qualification; crane testing, inspection, and maintenance; and implementation of technical specifications to prohibit movement of heavy loads over the spent fuel pool satisfy the criteria of the NRC guidelines.

Action is required by the Licensee to satisfy NRC criteria for safe load paths, procedures, special lifting devices, lifting devices not specially designed, and special attention for heavy loads handled over the core.

4. REFERENCES

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4. R. S. Hunter (IMEC)
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